CANNING PEACHES ON THE FARM

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IF A PEACH GROWER provides himself with canning equipment commensurate with the size of his orchard or adequate even for taking care of but a part of the crop, he is enabled at times not only to save much fruit which otherwise would be lost but he broadens his marketing possibilities.

Outside of California, where certain peach varieties are grown extensively for canning and drying, the average grower must market his fruit in the fresh state or not at all. In seasons of large crops prices sometimes drop so low that the fresh fruit is handled at a loss if shipped.

A grower who is able to can his fruit has a means of saving it for the time being, with the possibility of profitable sales at a subsequent date.

Moreover, it may happen in the average season that the fruit ripens at times more rapidly than it can be handled, and considerable quantities become too soft to ship. Unless local demands exist for such fruit it usually is lost, but if the grower is equipped for canning the possibility of saving it is at hand.

An outfit with a capacity of several thousand cans a day represents a comparatively small investment, and if properly cared for it will last for years.

A grower who produces a wide range of perishable crops is likely to find such equipment a valuable adjunct in saving parts of crops that would be lost without it.

This bulletin describes in considerable detail the various steps taken in canning peaches on a fairly large farm scale.

B. P. I.—621.

CANNING PEACHES ON THE FARM.

CONTENTS.

WHENEVER there is an abundant crop of peaches throughout the country, or in a considerable number of the important peach-producing regions, the profitable handling of the fruit is a matter of much concern to the growers. This is especially true if the centers of production are so located with reference to one another that glutted markets are anticipated as inevitable.

In view of the rapid extension of peach culture in recent years into new regions and with the increasing possibility that conditions unfavorable to the satisfactory marketing of the crop in a fresh state may prevail in some of them during almost any season, the attention of the growers is more and more being turned to the handling of the fruit in other ways. Canning is one of the possibilities to receive first consideration in many instances. The process is simple; it requires but a comparatively small investment, and one season with another it has been in the past a fairly profitable method of utilizing large quantities of fruit.

A cannery in connection with a peach orchard, commensurate in size with the orchard, may be made a profitable investment under many conditions. It is to the owner what evaporators are to the growers in some of the important apple-producing sections, where a considerable proportion of the growers have evaporators as adjuncts to their orchards. This provides a convenient and profitable means of using the poorer grades of fruit, while in seasons of heavy crops and low prices apples of good market grade are also handled in this way.

Even if a canning equipment in connection with a peach orchard is not needed for use every season, it will still serve to some extent

as an insurance against unduly sharp competition with the fresh fruit in glutted markets, for a convenient alternative is thus at hand whenever prices become unsatisfactory.

With the simple equipment by which it is possible to do good work in canning, only a relatively small investment is required. The quantity of fruit saved in a single season is often sufficient to more than pay for the whole cost of the equipment. If a grower is equipped for canning peaches he not only provides a way to protect himself when market conditions are unfavorable, but he has a ready means of using his poorer grades which, if shipped, as they commonly are, frequently bring only small prices at the best and at the same time depress the markets and reduce the prices for the better grades. Still other growers who have developed peach orchards where shipping facilities have proved inadequate, or where the orchards are isolated, or where other conditions have arisen which render the marketing of the fresh fruit unprofitable, have obtained satisfactory returns by putting the crop on the market in canned form at a later time.

In some sections of the country, particularly through the South, "home canners" are in common use. It is believed that their use could be greatly extended with profit and satisfaction to fruit and vegetable growers, not only in the South, but in other sections of the country as well.

In presenting this bulletin the writers make no claim to originality. They have been impressed with the need of information in a form readily accessible to fruit growers which would enable them to handle, when desirable to do so, relatively large quantities of fruit in some other manner than by shipping it in the fresh state. The existence of this need has been made apparent by observation, in requests for information made by correspondents, and in other ways. As opportunity has offered, therefore, a study has been made, in connection with other lines of investigation, of methods of canning, especially for peaches, in a considerable number of commercial canneries, as practiced in the use of several different makes of home-canning outfits, and in such other ways as has been possible. Experiment station bulletins, standard works on canning, and other literature relating to the subject have been freely consulted. The writers gladly make acknowledgment of their indebtedness to these sources of information. The matter here presented will not interest the expert canner. It is intended rather for the peach grower who is in need of preliminary information as to how to go about the canning of this fruit.

EXTENT AND LOCATION OF THE PEACH-CANNING INDUSTRY.

Primarily the regions in which peaches are canned are determined by the geographical distribution of the crop, but the extent to which canning is done in any year depends upon the abundance of

the crop. On account of the wide differences in production in different years it necessarily follows that statistics relating to the industry for a particular season are of definite value for that year only. The output may be greater or smaller, as the case may be, than the average for any considerable period of years.

In the present connection, however, data relating to the industry for two seasons are of some interest. Statistics gathered by the Bureau of the Census, Department of Commerce and Labor, in the season of 1904, and those reported by the Thirteenth Census (crop of 1909) are given below.

Quantity and value of peaches packed in different States.

State.	Canning season of 1904.		Canning season of 1909.	
	Cases.[1]	Value.	Cases.[1]	Value.
United States	1,302,715	$3,894,272	1,467,213	$3,753,698
California	744,715	2,640,524	1,149,590	3,013,203
Maryland	352,244	753,003	80,489	158,839
Michigan	68,269	179,838	74,595	175,386
Georgia			71,931	156,282
Texas	30,086	52,989		
Utah	17,845	43,868		
Ohio	12,762	35,134		
New York	10,060	39,399	41,727	141,142
New Jersey	9,767	19,370		
Arkansas			7,980	13,918
All other States	57,128	130,147	40,901	94,928

[1] A case is generally understood to hold 24 cans.

In the statistics for 1904 "all other States" includes Alabama, Arkansas, Delaware, Illinois, Indiana, Mississippi, Missouri, Nebraska, North Carolina, Oregon, Pennsylvania, South Carolina, Virginia, and West Virginia, together with small lots in still other States not named amounting to 14,576 cases, valued at $36,452. In the statistics for 1909, approximately one-half of the output from "all other States" was produced in three States (North Carolina, Ohio, and Tennessee), leaving only about 21,000 cases as the canned-peach product of all the rest of the country. It is worthy of mention that the value of canned peaches in the United States in 1899 exceeded the value in 1909 by more than half a million dollars.

It is assumed that the above figures relate to peaches that were canned in commercial establishments and do not include those packed on the farms. The price (and therefore the profitableness) to the grower of farm-packed goods is naturally influenced very largely by the commercial output. This is at least true so far as the farm pack enters the general market. The price in a personal market or to private customers is usually less subject to commercial conditions than in the general market.

PRINCIPLES UNDERLYING SUCCESSFUL PEACH CANNING.

The discussions which follow are intended to meet the conditions which confront the peach grower who has a moderate sized orchard and who desires to can his fruit or a portion of it for commercial purposes, but whose production does not justify an extensive outfit.

It is not the purpose of this bulletin to discuss at length the principles which underlie the operation. These have been previously given in sufficient detail for practical purposes in other publications of the Department of Agriculture.[1] The absolute necessity of completely sterilizing both the can and its contents in the final operations of the process can not be too often repeated or made too emphatic. Upon this one point hinges success or failure. No matter how much care and pains may be devoted to all the other steps in the process, if this one—sterilization—be not perfect, all the rest will amount to nothing and the fruit will spoil in the cans.

The spoiling of a can of peaches is due to the development within it of vast numbers of almost inconceivably small forms of plant life, the germs of which are so nearly everywhere present that they inevitably find lodgment on the fruit or in the can before or during the process of canning. Sterilization, as a rule, consists in raising the temperature to such a point and maintaining it for such a time that all these organisms are killed. Obviously, it follows that a can of goods once made sterile must be so handled that the contents can not again become the lodging place of any of these forms of life. The practical application of the foregoing remarks will be made apparent in later discussions. The absolute cleanliness of the place where the canning is done is of great importance in this connection, and the personal cleanliness of those handling the fruit, especially after it is peeled, is of primary concern.

EQUIPMENT.

CHARACTER OF OUTFIT.

The quantity of fruit to be canned determines very largely the extent and character of the equipment that will prove efficient and at the same time economical.

It may consist of a soldering copper and a small affair to be used on top of a kitchen stove, with a capacity of only a few dozen cans a day; or it may comprise a somewhat expensive collection of apparatus, an engine for furnishing steam and power, and other machinery which reduces hand labor to a minimum. The expensive type of equipment would rarely be installed under the conditions which this bulletin is designed to meet.

[1] Farmers' Bulletin 203, "Canned Fruit, Preserves, and Jellies;" also Farmers' Bulletin 359, "Canning Vegetables in the Home."

A canning outfit selected primarily for handling peaches, once obtained, will often be found useful for the canning of other farm and garden products. For most fruits and some vegetables, nearly the same equipment will suffice as for peaches, but for others, especially for most vegetables, certain additional articles will be desirable.

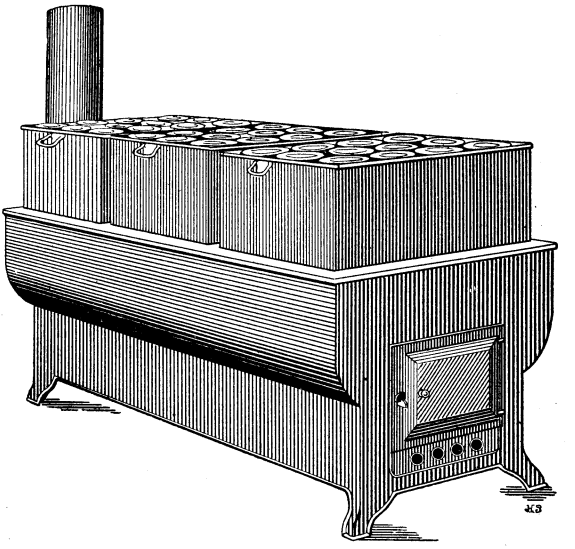

FIG. 1.—A portable canner.

PORTABLE CANNERS.

Portable canners are outfits which, as the name implies, are so constructed that they may be readily moved about from place to place as occasion demands.

Many different makes of these outfits are offered for sale by different manufacturers. Most of the types on the market are made in several different sizes. They range in size, as already stated, from scarcely more than that of an ordinary wash boiler, intended for use in the kitchen and costing perhaps $5 or less, to one having a capacity of several thousand cans a day and costing from $75 to $100 or more.

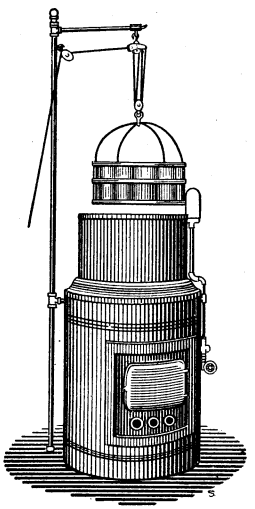

FIG. 2.—A portable canner with a small hoist for handling crates of cans.

The various types of "home canner" outfits cover a wide range in the manner of construction. In some, the tank, or vat in which the fruit is cooked, is attached to or is made a part of the fire box. Such a canner is shown in figure 1. Another type, which might be termed an "upright" canner to distinguish it from those that occupy a more horizontal position, is shown in figure 2. Others consist of merely the vat, for which the fire box, usually made of brick or stone, must be built by the purchaser. Detailed specifications and instructions for making the permanent base are furnished by the vat manufacturers in some cases.

Canners which are intended to be used over a permanently placed base or fire box, such as those last referred to, while not properly

grouped with portable canners, are not unlike them save in the portable feature. They are an important type and under many conditions may be made to serve the purpose as well as those which combine fire box and cooking tank.

Whatever the type, it is important that the cooking vat be so placed with relation to the fire box that as much of its surface as possible is exposed directly to the heat. Constant boiling of the water in the vat is essential to rapid work, and disregard of this point in the construction may entail considerable loss, either of heat or of time.

One or more perforated sheet-metal, strap-iron, or heavy wire crates of such size as to hold the cans conveniently and fit readily into the cooking vat are ordinarily furnished as a part of each canner, by means of which the cans are easily and quickly placed in and removed from the cooking vat.

Many manufacturers furnish the necessary accessories and some include them in the prices ordinarily quoted for their outfits. Some also furnish with their outfits printed instructions which contain much information about the canning of fruits and other products that is of value to those who are not familiar with the operation. The accessories will be mentioned in some detail on a later page.

STATIONARY APPARATUS.

If somewhat extensive operations are planned, and especially if a considerable variety of products is to be canned, so that a permanent building can be set apart for the work, a more elaborate type of equipment may be desirable. It may be an advantage to assemble the parts from different manufacturers who are specialists in the particular line of apparatus which they manufacture. On the other hand there are companies which make a specialty of equipping canneries, and some even construct the necessary buildings and install the equipment ready for use.

A more extensive equipment might include a crane for hoisting the crates of cans when placing them in or removing them from the cooking tank (or "process kettle," as it is more commonly called), an automatic soldering machine for sealing the cans, a continuous exhaust tank, and other pieces of apparatus designed to accomplish the rapid and easy handling of large quantities of fruit.

The use of automatic machines would require the installing of an engine to furnish power to run them. Both steam and gas engines are used for this purpose. If the former is used the cooking tank may be heated by steam instead of by direct contact with the fire box.

From the foregoing statements it will be understood that different outfits may vary greatly in cost, complexity of apparatus, and in other ways, according to individual needs and preferences.

The accompanying illustrations, which show various phases of equipping small canneries, will be suggestive. Figure 3 is a small home canner temporarily placed in a peach orchard. The simplicity of the equipment is apparent, and the illustration is largely self-explanatory. The cooking tanks are made of heavy galvanized sheet iron and are placed over fire boxes made of small flat stones. The wisdom of constructing the fire boxes so loosely, with open joints, is doubtful, on account of the loss of heat. The fire is fed through an opening in the stonework at the end opposite the smoke pipe. The fruit is prepared in the tent adjoining. The two rectangular, boxlike receptacles to be seen on the ground between the pile of cans at the left of the picture and the corner of the tent are perforated sheet-iron crates in which the cans are placed for transfer to and from the cook-

FIG. 3.—A small canning outfit temporarily placed in a peach orchard.

ing tank. The rods attached lengthwise and a few inches above the tops of the crates serve as handles. Flat-bottomed baskets made of heavy wire or crates made of strap iron may also be used for this purpose.

Figure 4 is a view of an equipment somewhat more extensive than the preceding one. In this outfit the cooking tank is placed over a brick base which is also the fire box. The general plan of construction, both of the tank and of the shed which protects the workers from the hot sun and from the rain, is sufficiently clear to render a detailed description unnecessary. The perforated sheet-iron receptacle in the foreground of the picture is the crate for use when the cans are transferred to and from the cooking tank, as described in the preceding paragraph. This tank is large enough to hold five of these

crates at one time. An extra crate is provided, so that it may be filled with cans while the others are in the tank. Each crate holds 60 No. 3 cans, and 300 cans of this size may thus be cooked at one time.

The crates, when filled, are easily handled by two men by means of a stout stick, which is somewhat longer than the crate and is provided with two hooks so placed that they will readily catch under the handle of the crate near the ends. This makes it possible for attendants to handle the crates in an advantageous manner, even though they are quite heavy. Such a crate lifter is shown in figure 4, lying across the left-hand end of the cooking tank.

Similar crates and methods of handling them are used with a large proportion of the portable canners and other types of home outfits that are on the market.

Figure 5 shows an equipment somewhat more permanent and expensive than those previously mentioned, yet it is not out of proportion to the size and demands of a great many peach orchards owned by single individuals. The building is a plain board structure which can be erected without skilled labor other than a single moderately good mechanic capable of directing the work. The lumber need not be of an expensive grade.

The fruit is received at the end of the building at the right of the picture. In the course of preparation for and packing into the cans the fruit passes the length of the inclosed part of the building to a

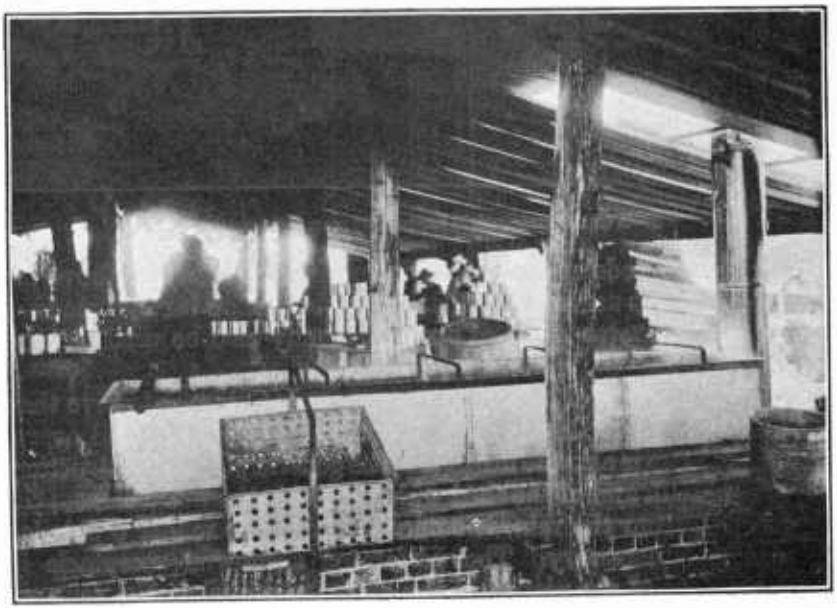

FIG. 4.—A farm canning outfit operated in a cheaply constructed shed.

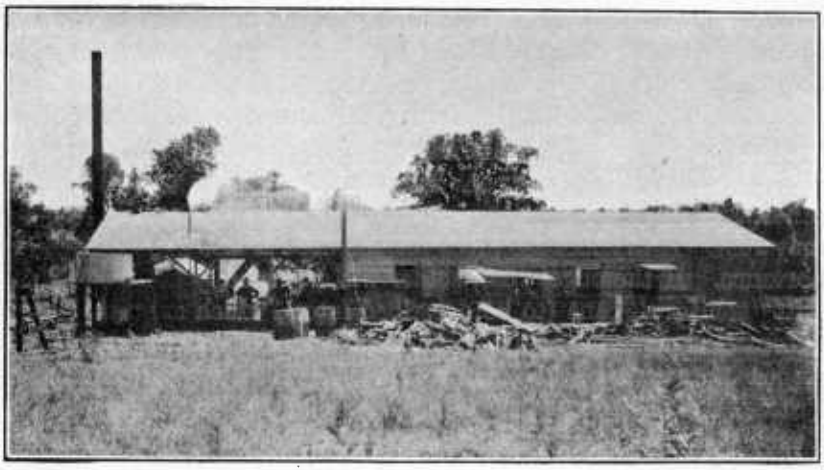

FIG. 5.—A farm canning outfit installed in a specially constructed building.

point near the open portion. Here the cans are capped or sealed by a seaming machine. The cans are then put into strap-iron crates and placed in heavy cylindrical kettles, about 3 feet in diameter and 4 feet or more in depth, which serve as cooking vats. These kettles are located in the open portion of the building near the place where several persons may be seen standing. The crates are hoisted by a crane, thus making the expenditure of strength by the operator comparatively small. The vats are heated by steam supplied from the boiler located at the extreme left in the open part of the building.

The elevated circular tank at the corner of and outside the building is the water reservoir. The water is carried in pipes by gravity to the points where it is needed for use The water supply is pumped from a well not readily visible at the extreme left of the picture. The pump is operated by steam from the boiler, and the seaming machine, which seals the cans, is operated by an engine.

Figure 6 shows the floor plan of a small cannery, such as could be built by ordinary farm labor with the aid of some one to lay out the work. The inclosed portion of the building is 20 by 30 feet, with an open shed at each end, as shown in the diagram. If the shed at the right is provided with a raised floor or platform it will be a convenience in delivering the fruit. The ends of the main portion of the building may be left entirely open to allow the greatest possible freedom of movement between the open sheds and the interior.

Other details of arrangement are largely self-explanatory. If the fruit is dipped in boiling water, as some recommend, to facilitate the removal of the skin, a scalding tank may be substituted for one of the peeling tables shown in figure 6. The supply of cans should be con-

venient to the packing table. There may be space on the floor of the building for a large number of cans, or the building may be high enough to store them on a floor above the workroom, from which they may be delivered directly to the packing table by means of a chute. If outside the cannery, the place of storage should, for convenience, be easily accessible from the packing table. In any case, the place where the cans are stored should be thoroughly dry; otherwise the cans, especially about the edges of the hole in the top, may rust. A dry storage place for the caps is also of particular importance. If the edges rust, solder will not readily adhere to them.

If "sanitary" cans (to be described later), which are sealed by an automatic machine, are used, the capping and tipping tables may be dispensed with and the sealing machine located in their space. Provision would then be necessary for an engine of some type. The "exhaust" and "process" vats are commonly placed over the same

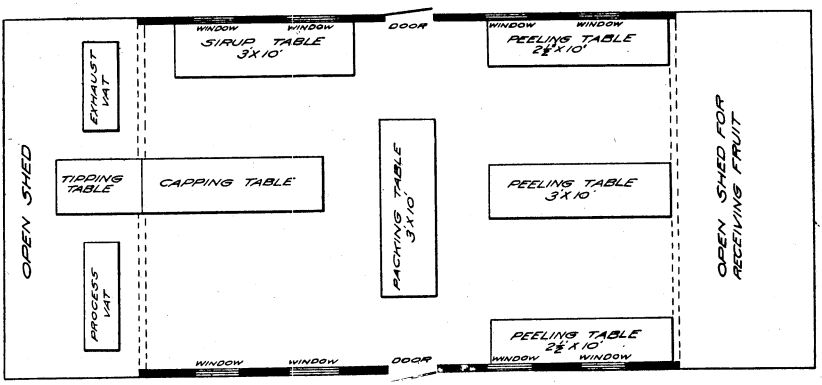

FIG. 6.—Floor plan of a small cannery.

fire box; the arrangement suggested in the diagram could be changed accordingly. In fact, the details of arrangement admit of wide variation to suit individual needs and conditions, but it is important that the tables and other articles of equipment be placed with reference to the order in which the various operations are performed.

A floor in the cannery which admits of frequent and thorough scrubbing will add greatly to the cleanliness of the surroundings.

ACCESSORIES.

The parts of a canning outfit already discussed, which are concerned directly with the cooking or "processing" of the fruit, constitute what may be termed the major items of equipment applying to small canneries where all operations are done by hand, but a considerable number of minor items of equipment, or accessories, are as essential as these major items. A wide range of choice may be exercised in making up the accessories for any outfit, and the prices of the various

articles have a considerable range, depending upon the exact style or make of the goods; but the following list of articles, with suggestions as to probable cost, will enable the reader to make a general estimate of the capital needed for his outfit.

List of articles and estimated cost for equipping a small cannery.

Article.	Estimated cost.	
	From—	To—
Paring knives, for peeling the fruit.....per dozen..	$0.60	$1.35
Pitting spoons, for removing pits.....do....	.....	1.50
Large tin pans, or, better, large wooden bowls, for receiving fruit after it has been peeled:		
Tin pans.....each..	.75 and up.	
Wooden bowls.....do....	.50 and up.	
Capping steels and holders for sealing cans (price depending on size), about...do....	2.50	.....
Tipping coppers, for closing vents in caps.....do....	.50	.75
Fire pot, for heating capping steels and tipping copper:		
For gasoline burner.....do....	4.50 and up.	
For charcoal burner, much less.		
Brushes, for cleaning tops of cans.....per dozen..	1.00	1.50
Solder.....per pound..	.30	.....
Soldering flux (varies with brand and strength) in quantity, concentrated form..do...	.04	.08
Tongs, for handling hot cans.....each..	.35	.....
Trays in which to place the cans after they are filled, for convenience in handling, to be made at home, using ½-inch boards.		
Good supply of pure water.		

Some of the above-named accessories call for further comment. In place of paring knives machine parers are sometimes used where the extent of the business warrants it. Machines similar to those used for paring apples serve a good purpose if they are provided with a suitable fork for holding the fruit and a knife blade that is specially designed for peach work.

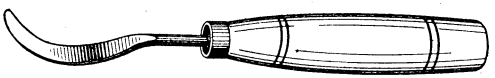

FIG. 7.—A pitting spoon.

Pitting spoons are intended for removing the pits from clingstone varieties. One is shown in figure 7. The pits of freestone sorts are easily removed with the fingers or with the point of a hand paring knife.

If only a small amount of work is to be done it is possible to seal the cans with a tipping copper (fig. 8), used primarily in sealing the

FIG. 8.—A tipping copper.

small vent in the caps, but if a large quantity of fruit is to be put up it will pay to use a capping steel made especially for this purpose. Steels are of two leading types. In the one here designated the "segment" steel, the part that comes in contact with the edge of the cap where it is sealed to the top of the can is in the form of a

segment of a circle corresponding in size to the cap itself (fig. 9). In the other type of capping steel the part that comes in contact with the cap forms a complete circle instead of a segment (fig. 10). Unless the operations are very limited, at least two each of the capping steels and tipping coppers should be provided, to permit the heating of one while the other is in use.

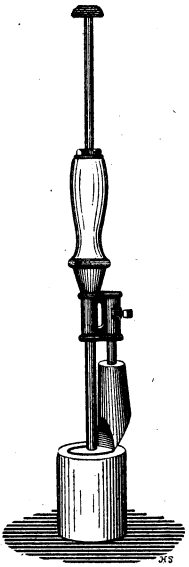

FIG. 9.—A segment capping steel.

The repeated heating of these tools, especially overheating, makes occasional repairing necessary. Until they become much worn and need reshaping, this consists in recoating the working edge, or the point (of a tipping copper), with tin. The details of this operation may be varied more or less, but they are essentially as follows: Heat the copper or steel nearly red hot; make the point or edge thoroughly clean and bright by filing or rubbing on a brick or other similar surface; on a piece of clean tin place a small quantity of soldering flux and in this put a small piece of solder; melt the solder with the hot copper or steel, and while the latter is still very hot rub it in the melted solder until the tin adheres. The proper temperature of the tool is important, since the tin will not adhere if it is either too hot or not hot enough.

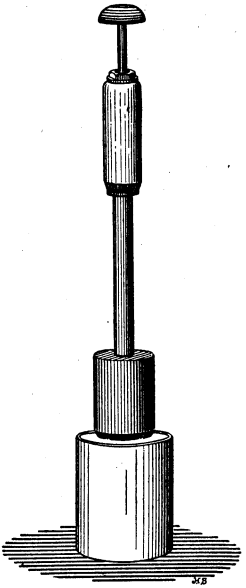

FIG. 10.—A round capping steel.

What is known as "segment" solder is generally considered preferable to "stick" solder for sealing cans. In the segment form the solder is cut up into small pieces. For tipping the cans (to be described later), "wire" solder, in the form of wire wound on large spools, is very convenient.

FIG. 11.—Tongs for handling cans when hot.

Soldering flux may be bought in the form of crystals to be dissolved or as a concentrated liquid to be diluted before using.

In place of tongs (fig. 11) for handling hot cans, gloves which do not heat through too quickly may be used and are, perhaps, more convenient except when it is necessary to remove a can from boiling water.

Trays 2 or 3 inches deep and of sufficient size to hold a dozen or more cans greatly facilitate handling the fruit. The cans are

placed in the trays after they are filled with fruit and remain in them as they are passed to the sirup table and thence to the capping table. The number of trays needed will depend on the extent of the operations. They are easily made of any suitable $\frac{1}{2}$-inch lumber.

For the convenient heating of the capping steels and tipping coppers a fire pot is necessary. While it is possible to heat them by other means, it is usually impracticable to do so where any considerable quantity of canning is being done. A fire pot of very simple construction for burning charcoal is shown in figure 12. Figure 13 shows one designed to burn gasoline. This type costs considerably more than a charcoal burner, but it is more convenient and the heat is under better control

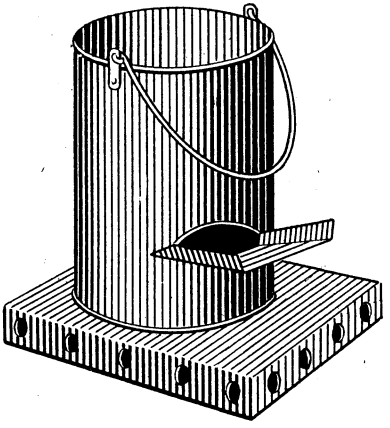

FIG. 12.—A charcoal fire pot.

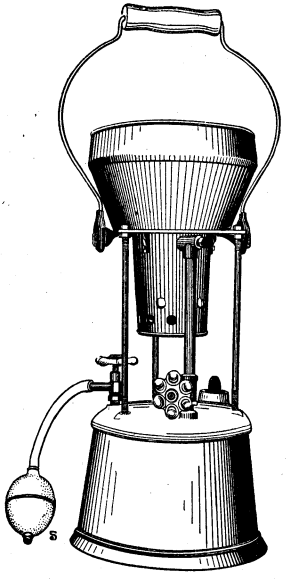

FIG. 13.—A gasoline fire pot.

An adequate supply of pure water is demanded for the best results. If piped to the points where it is needed for use, a great saving of labor over carrying it in pails or buckets will be effected

CANS.

A considerable number of different kinds, types, and sizes of cans are used for putting up peaches. For commercial purposes, what is known as a No. 3, of which there are several styles, is the size in which most of the better grades are packed. This can is made with two different-sized openings in the top; one is $2\frac{1}{16}$ inches in diameter, the other $2\frac{7}{16}$ inches. On account of the size of many of the peaches that are canned the one with the larger opening should be used. The poorest grade of peaches, commonly called "pie peaches," is often put up in No. 10 cans. These cans are also made with the two sizes of openings in the top, as mentioned above. This low grade of goods is usually made up of small fruit, but the cans with the larger openings are preferable on account of the greater ease and rapidity of filling.

The dimensions of these two sizes of cans, as adopted by the Baltimore Canned Goods Exchange, are as follows: No. 3—diameter, $4\frac{3}{16}$ inches; height, $4\frac{7}{8}$ inches. No. 10—diameter, $6\frac{1}{4}$ inches; height, 7 inches.

These dimensions, however, are not adopted by all manufacturers, so that there is more or less variation from the above in some of the makes of cans.

The cost of cans varies more or less from year to year, but quotations for the season of 1910 will help the purchaser to approximate this item of expense.

Quotations on cans for the season of 1910.

Size of can.	Size of opening (inches).	Price per thousand.	Size of can.	Size of opening (inches).	Price per thousand.
No. 3	$2\frac{1}{16}$	$15.50	No. 10	$2\frac{1}{16}$	$40.00
No. 3	$2\frac{7}{16}$	16.00	No. 10	$2\frac{7}{16}$	40.50

These are f. o. b. quotations on car lots, with the loose cans stacked in the cars. In less than car lots the crating or boxing of the cans is necessary. They may be crated at an additional cost per thousand over the above prices of about $1.75 for the No. 3 and $7.50 for the No. 10. The boxes ordinarily supplied when the box package is provided for shipping cans are the cases that later on are used in marketing the canned fruit. The sizes for the No. 3 and the No. 10 cans each hold, respectively, two dozen and one dozen cans. The former cost about 10 cents, the latter about 17 cents each.

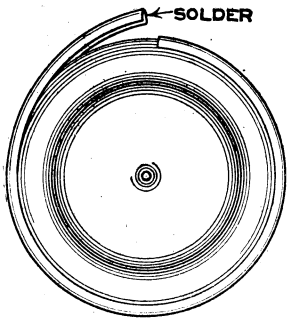

FIG. 14.—A solder-hemmed cap.

If solder-hemmed caps (fig. 14), that is, caps the edges of which are bordered with solder, are desired, instead of the ordinary kind, they may be had at an additional cost per thousand over the above prices of about $1.10 for the $2\frac{1}{16}$-inch size and $1.40 for the larger size. With these caps it is not necessary to apply solder in the usual way in sealing the cans. This makes it possible to seal the cans more rapidly than when the ordinary caps are used.

Another type of can which is highly recommended and used by many is known as the "sanitary" can. In this style the top is not put on until after the can has been filled. With the larger opening a better pack is possible than where the contents must be pressed through a relatively small hole, as in the ordinary type. The top is crimped or seamed on after filling without the use of

solder. An engine of some type is necessary to operate the seaming machine. While these cans cost somewhat more than the others, there is a saving in the cost of solder, since none is used, and possibly also in labor. It is claimed that 8,000 to 12,000 cans can be sealed in a day of ten hours with one of these machines.

It should be stated in this connection that the No. 3 size was formerly referred to quite generally as a 3-pound can and the No. 10 as a gallon can. In fact, these terms are still in frequent use. These sizes, however, should be designated by number. The No. 3 can holds only about 2 pounds, net, of fruit together with the liquid contents, so that to refer to this size as a 3-pound can is misleading.

Agencies of many of the can manufacturers are widely distributed. On account of freight charges, the proximity of the shipping point to the place where they are to be used should be considered in ordering cans.

HANDLING THE FRUIT FOR CANNING.

GRADES OF CANNED PEACHES.

It is necessary, in the handling of the fruit and in its preparation for the cans, to regard the grade of goods that is to be put up. Grades are designated by various terms more or less indicative of the quality or size of the fruit used, such as "extras," "extra standard," "standard," "pie fruit," etc. These terms, however, are used more or less loosely and do not have a uniform significance.

The requirements of the Baltimore Canned Goods Exchange for the "table" or "sirup" grades are as follows: "Cans full, fruit good size, evenly pared, cut in half pieces, put up in not less than 10° cold cane sirup." For "pie fruit" the requirements are: "Cans full, fruit sound, unpared, cut in half pieces, put up in water."

The "extra standard" of some packers calls for fruit not less than 2½ inches in diameter with a sirup of about 30° density. "Extras" on this basis of grading should consist of fruit 3 inches or more in diameter with a very heavy sirup. Other grades call for fruit not below a certain size and a sirup of some specified density. Much fruit is put up in sirup having a density of 10° to 20°, the heavier sirups being used only for the "extra fancy," or other very high grades.

MATURITY OF FRUIT FOR CANNING.

To be in the best condition for canning, peaches should be well ripened, but still moderately firm. If too soft the fruit will not retain its shape in the cans, but will become more or less "mushy," thus injuring its appearance when the cans are opened. Soft fruit,

canned in order to save it, should not be put on the market as "extra" grade goods, or the reputation of the one who canned it will suffer. Fruit of different degrees of ripeness or of different texture should, therefore, not be mixed, but each lot of the same degree of maturity and the same texture should be handled by itself.

The number of cans which a given quantity of fresh fruit will make depends upon several factors, such as the grade, size, and consequent proportion of waste in pits and skins, closeness of the pack in the cans, etc. Most estimates, however, place the quantity at from 18 to 20 No. 3 cans per bushel for fruit that is of good size and grade.

PREPARING THE FRUIT FOR THE CANS.

The first steps in preparing the fruit for the cans are to remove the skins and pits. All grades for table use should be made up of peaches that have been halved, the division being made through the suture. The halving is done in connection with the removal of the pits.

If done by hand it matters little with freestone varieties whether paring is done first, followed by halving and pitting, or vice versa. But with clingstone varieties a finished product of probably finer appearance can be produced if the fruit is halved and pitted before it is pared. The tight gripping of the halves, which is necessary in removing the pits, may result in the flesh being more or less bruised and crushed unless the skin is allowed to remain in order to give some protection to the fruit.

The paring, if by hand, is usually done with sharp straight-backed knives, care being taken to remove only a very thin and even peeling in order that the flesh of the fruit shall be smooth and attractive in appearance. The pits of freestone varieties, after the fruits are halved, may be removed with the point of a knife or with the fingers. A pitting spoon (fig. 7) is desirable for removing pits from clingstones.

If a paring machine is used it is obviously necessary to peel the fruit before it is halved.

A method of peeling, sometimes recommended, but apparently rarely used, is to scald the fruit sufficiently to cook the skin slightly, but not enough to materially soften the flesh of the fruit. The skin is then easily scraped or rubbed off. If this method is adopted under arrangements similar to those suggested on page 11 and in figure 6, the scalding vat or tank may be located conveniently in one end of the open shed where the fruit is received or in the space occupied by one of the side peeling tables.

In large commercial canneries the "alkali process" of removing the skins is employed in some sections, especially in California. Under this process the fruit, after it has been halved and pitted, is

dipped into a very hot alkali bath for a very short space of time and is then passed through a machine in which it is carried under a large number of small jets of water, which are driven with sufficient force to remove the skins from the peaches and also to wash the alkali from the fruit. To be handled by this process fruit should be well ripened and free from bruises.

Pie peaches, which comprise a grade consisting usually of small fruit, are washed, if necessary, to remove grit or other forms of dirt; if very "fuzzy," they should be rubbed with a coarse cloth and then halved and pitted, but ordinarily they are canned without paring.

FILLING THE CANS.

The fruit should be put into cans as soon as possible after the freshly cut surfaces have been exposed to the air. Otherwise the surfaces turn dark and become unattractive in appearance.

Filling the cans with the table grades is generally done by hand. The halves are put into the cans usually flat or pit side down, each piece being placed with considerable care so that the contents of the can will be fairly solid and to insure a uniform content as to quality of fruit in each can. The cans should be filled very nearly full of the halved fruit. They are then ready for the next step.

A boxlike device is sometimes used as a filler to facilitate the work of putting pie peaches into No. 10 cans. This device has a depth of 6 or 8 inches, and is constructed with holes in the bottom which correspond with the holes in the tops of the cans when a particular number of them are arranged in a certain definite order. The fruit is poured into the filler, from which it drops or is readily pushed into the cans.

SIRUPING.

Peaches of all the better grades are canned in a sirup made of sugar and water. Sirup of different density or strength is put into goods of different grades. The "pie fruit" is put up without sirup, but the cans, after receiving the fruit, are filled with water; then they are ready for the next treatment.

There are two methods in common use of adding the sirup to the better grades. One method is to put the desired quantity of dry granulated sugar in each can before it is filled with fruit. The fruit is then put in, after which water is added. This may be either hot or cold, depending upon the exact details of the practice being followed. Boiling water, however, is more commonly used.

The quantity of sugar used varies with the different grades and with different operators. From $1\frac{1}{2}$ to 3 pounds for each dozen of No. 3 cans are about the usual limits. A larger quantity is occasionally used, but not often.

In commercial canneries the sugar is more commonly added as a sirup, and it is probable that this is the preferable way. It is of uniform density throughout and it is claimed that it penetrates the fruit better and more uniformly than when the sugar is added in dry form and dissolved in the can.

If the sirup is made by placing dry sugar in the cans and the arrangement of the cannery is comparable with that shown in figure 6, then the sugar should probably be put into the cans after they are placed on the packing table. The sirup table would then be the logical place at which to add the water.

In either method the cans should be filled with the liquid (water or sirup) to within about one-fourth inch of the top. If the liquid is in actual contact with the top of the can the cap can not be readily soldered.

For preparing sirups a gauge is useful, but not essential. By its use the density can be determined at any moment, and by adding more sugar or more water the density can be increased or decreased as desired. As a gauge is not expensive, its use is advisable.

Sirup is made by dissolving sugar in water, preferably boiling it slowly for a few minutes after it is dissolved. It should be stirred until the sugar is in solution but not during the boiling. The density of sirup varies somewhat with its temperature. As measured by what is known as the Baumé scale of density, when at a temperature of 60° F., a gallon of sirup having certain specified degrees of density may be made approximately correct with the quantities of sugar stated below: [1]

Quantity of sugar required to make a gallon of sirup of different degrees of density at 60° F.

Sugar per gallon.	Density.	Sugar per gallon.	Density.	Sugar per gallon.	Density.
Pounds.		*Pounds.*		*Pounds.*	
2½	15	4½	25	7	35
3½	20	5⅝	30	8½	40

Sirups of the lower density are used for most grades of peaches. Even a 10° sirup is frequently used. The "extra" grades, however, are generally put up in one of the heavier sirups.

In canning on a small scale the method of sweetening the fruit by adding dry sugar is generally used, as it calls for less apparatus and possibly for less skill, but in commercial canneries the sirup is more commonly made separately and then added.

[1] From "A Complete Course in Canning," p. 83.

CAPPING.

After the cans are filled with fruit and sirup, or water has been added, they are ready to be capped and sealed. With the ordinary type of can the tops are first brushed to free them from particles of fruit, water, etc., that may have lodged there, and then the caps are put in place. With a small brush or swab the edge of the cap and the portion of top of the can immediately surrounding it are moistened with the soldering flux to insure the adhesion of the solder; then they are sealed with a capping steel or copper. This tool should be so heated as to readily melt the solder and spread it around the edge of the cap. After heating either tool, before it is used, the edge or point should be wiped on a damp cloth or dipped in a dish or can containing a quantity of soldering flux. If a soldering copper is used, the cap should be firmly held in place with a small stick or rod in the left hand while the copper is used in the right for melting and distributing the solder about the edge of the cap. If a capping steel is used, the solder is distributed by placing the steel over the cap where it comes in contact with the solder and rotating it back and forth sufficiently to spread the solder uniformly about the edge of the cap.

If "sanitary" cans are used, they are ready for sealing as soon as they have been filled with fruit and sirup. They are put through a seaming machine which crimps on the tops and seals without the use of solder.

EXHAUSTING.

If the fruit is canned cold—that is, if the water or sirup is cold when added—it is a common practice to "exhaust" the cans.

This operation consists in submerging the cans to within about 1 inch of the top in boiling water for about five minutes for No. 3 cans and seven minutes or more for No. 10 cans. This results in the expansion of the contents of the cans and the expulsion of any air bubbles that may have been formed during the filling. The air escapes from the cans through a small vent in the center of the caps. This hole is made with the same die by which the caps are cut.

Exhausting may be accomplished by several different methods. The depth of the cooking tank furnished with many of the portable canners and other small outfits is such that one tier of cans can be exhausted while the lower tier or tiers are being cooked. In some of the large canneries exhausting is accomplished by an automatic machine which carries the cans through the bath on a sprocket chain arrangement, the rate of movement being regulated in accordance with the length of time it is desired to continue the operation.

If a canning outfit includes a boiler the cans may be exhausted by steam, either in a closed cooking or processing retort or in a steam

exhaust box designed for the purpose. The steam bath should be continued until the contents of the cans are thoroughly heated, three to five minutes will usually be required for No. 3 cans.

Exhausting is not an essential step in canning peaches, and it is omitted by many operators, but when it is omitted somewhat longer time for cooking or processing is required.

TIPPING.

As soon as the exhausting is completed, the cans are "tipped." That is, the small hole or vent in the cap is closed by the use of the tipping copper and a small bit of solder.

If the peaches are canned hot and the cans are not exhausted they are ready to be tipped as soon as they are capped. "Sanitary" cans, of course, require no tipping.

PROCESSING.

Cooking, sterilizing, and processing are terms that are frequently used and which mean practically the same thing when applied to canning operations. Processing, however, is the more technical word and the one that is generally used by canners themselves and by others who are most conversant with the subject. The one in charge of this part of the work is called the "processor." Processing is the last step in canning the fruit. In some respects it is the most important. Its primary object is to sterilize the contents of the cans. If it is improperly done, the fruit will not keep. Processing consists in completely submerging the cans beneath boiling water until the fruit is cooked and all germs which might otherwise result in the spoiling of the fruit are destroyed.

If the fruit has been exhausted and is at once processed before it cools off, ten minutes is generally considered adequate for processing No. 3 cans. If, for any reason, the water drops below the boiling point when a crate of cans is put into it, the duration should be measured from the time the boiling point is again reached. If the cans are cold when they are processed, fifteen minutes is the time commonly given for No. 3 cans. No. 10 cans require considerably longer. Most authorities advise twenty to twenty-five minutes following seven minutes in the exhaust bath.

It is possible to process by steam in a closed retort. By this method the cans are put into the retort and the latter is filled with water up to the upper blow-off pipe. The lid is then bolted securely in place and the steam turned on. The pressure gauge is usually set at about 12 pounds, which is equivalent to a temperature of approximately 240°. At this temperature No. 3 cans are processed from two to four minutes and the No. 10 size five minutes or more.

During the processing, by whatever method, critical examination of the cans should be repeatedly made for the detection of leaks. A continuous series of small bubbles arising from the same place indicates that a can is leaking. The can should be located, at once removed, and the defect repaired. This can usually be done to advantage with a tipping copper.

Some authorities advise placing the cans in a cold-water bath after processing, but this appears not to be a usual practice, especially among small canners. The object is to reduce the temperature of the cans to such a degree that cooking will cease. Otherwise if the cans are at once stacked in a large pile, a sufficiently high degree of temperature may be retained to continue the cooking to such an extent that the texture of the fruit will be injured.

In the processing of peaches it is necessary to cook the fruit thoroughly in addition to destroying all the germ life that it may contain. Obviously, the condition of the fruit with regard to its degree of ripeness, its texture, etc., will influence its cooking quality. If not cooked enough, it will be too hard, and if overcooked, so that the texture is destroyed, the halved pieces, which should retain their form, are likely to mash down. The various lengths of time heretofore suggested for processing represent the experience of many operators, but they should not be accepted as applying to all conditions.

It is of great importance that specimen cans of the finished product be examined occasionally to determine if any changes in the processing or in any of the other features of the work are advisable or necessary. This is especially true when the fruit that is being handled from day to day varies in quality, texture, or in other ways. When a correct processing period has been determined for a particular lot of fruit it should be followed to the very minute, otherwise the finished product will lack uniformity in quality and appearance.

As already indicated, processing is a rather critical operation. The experience and judgment of the processor count for much in the success of the work and in the grade of the finished product. Many factors need to be considered, each of which has its effect on the results of the work. It is in fully comprehending just what these effects are and their relation to each other that the skill and judgment of the processor are of the greatest importance. But this comprehension of the matter can be acquired only by experience.

Processing completes the operation of canning the fruit. In this stage it is in condition to hold until market conditions warrant its sale. Large commercial canners usually put labels on the cans before they are sold which give the brand, grade, etc. This is of importance in establishing and maintaining a reputation. Such labels serve as a dvertisement of the goods, and at the same time, if made from istic design, make the cans much more attractive in appearance ney would be without labels.

MARKETING THE CANNED PRODUCT.

It is obvious that the financial success of this method of handling a peach crop, or any portion of it, depends upon placing it on the market at a satisfactory profit. As a rule, home-canned goods, if of good quality, find a fairly ready sale. They are commonly sold on sample to retail grocers and provision dealers. Comparatively large quantities can frequently be sold directly to consumers. A wisely placed advertisement in a local or county paper may also help in making sales. If a large quantity of fruit has been canned, it may be of advantage to sell through a jobber or a broker who handles canned goods.

The cans are generally packed in cases for the trade. The ordinary case holds two dozen No. 3 cans placed in two tiers, one dozen in each tier. The usual case for No. 10 cans holds one dozen. These cases may be obtained from the manufacturers of cans, as previously stated, or in shook form from various box and package manufacturers.

In this connection attention should be called to the Federal food and drugs act of June 30, 1906, in its relation to the labeling or branding of canned goods that enter interstate commerce. Any statement that is stamped or printed on the cans or on the cases in which they are packed regarding the weight, identity, quality, or place of production which is misleading constitutes, under the terms of this act, a misbranding of the goods.

All requirements of the food and drugs act which should be considered in canning peaches may be ascertained by addressing the Chief of the Bureau of Chemistry, Department of Agriculture, Washington, D. C.

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